



# Sun StorEdge™ PCI/PCI-X Dual Ultra320 SCSI Host Adapter Installation Guide

---

Sun Microsystems, Inc.  
www.sun.com

Part No. 817-5827-13  
January 2007, Revision A

Submit comments about this document at: <http://www.sun.com/hwdocs/feedback>

Copyright 2007 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.sun.com/patents> and one or more additional patents or pending patent applications in the U.S. and in other countries.

This document and the product to which it pertains are distributed under licenses restricting their use, copying, distribution, and decompilation. No part of the product or of this document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, AnswerBook2, docs.sun.com, Sun StorEdge, SunVTS, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and in other countries.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

Adobe is a registered trademark of Adobe Systems, Incorporated.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

U.S. Government Rights—Commercial use. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

---

Copyright 2007 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, Californie 95054, Etats-Unis. Tous droits réservés.

Sun Microsystems, Inc. a les droits de propriété intellectuelle relatants à la technologie qui est décrit dans ce document. En particulier, et sans la limitation, ces droits de propriété intellectuelle peuvent inclure un ou plus des brevets américains énumérés à <http://www.sun.com/patents> et un ou les brevets plus supplémentaires ou les applications de brevet en attente dans les Etats-Unis et dans les autres pays.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, AnswerBook2, docs.sun.com, Sun StoreEdge, SunVTS, et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays.

Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

Adobe est une marque enregistrée de Adobe Systems, Incorporated.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

LA DOCUMENTATION EST FOURNIE "EN L'ÉTAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFAÇON.



# Contents

---

<b>Preface</b>	v
<b>1. Installing, Connecting, and Testing the Host Adapter</b>	<b>1</b>
Features	2
Installing the Host Adapter	3
▼ To Prepare for Hardware Installation	4
▼ To Install the Host Adapter	7
Connecting the Host Adapter	8
▼ To Connect SCSI Cable(s) From the Host Adapter to the Storage Device(s)	8
Testing the Host Adapter	9
▼ To Test the Installation Using the <code>probe-scsi-all</code> Command	9
▼ To Test the Installation With the SunVTS Software	10
Booting the Host Adapter	11
<b>A. Ultra320 SCSI Configuration</b>	<b>13</b>
Target Devices	13
Bus Length	14
Cabling and Termination	15
Cabling	15
Termination	15

SCSI Symbols	16
<b>B. Specifications</b>	<b>17</b>
Physical Dimensions	17
Power Requirements	18
Performance Specifications	18
PCI Edge Connector Pin Definitions	19
SCSI Connector Pin Definitions	21
<b>C. Declaration of Conformity, Regulatory Compliance, and Safety Statements</b>	<b>23</b>
<b>Declaration of Conformity</b>	<b>24</b>
<b>Regulatory Compliance Statements</b>	<b>26</b>
<b>Safety Agency Compliance Statements</b>	<b>27</b>

# Preface

---

This *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Installation Guide* is intended for experienced system administrators.

---

## Before You Read This Book

Before you install and use the Sun StorEdge™ PCI/PCI-X Dual Ultra320 SCSI host adapter as described in this manual, you must read and understand the documents listed in the following table.

Topic	Title	Part Number
Release Notes	<i>Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes</i>	817-5828-xx The release notes list supported cables, platforms, and storage devices along with other essential information. See <a href="#">"To Access the Release Notes"</a> on page viii.
Diagnostics	<i>SunVTS 5.x User Guide</i> <i>SunVTS 5.x Reference Manual</i>	Varies according to the SunVTS software version being used. A different version of the SunVTS software is released with each release of the Solaris operating system

---

## How This Book Is Organized

- [Chapter 1](#) describes the Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter and explains how to install it on your system, connect it to a storage device, and test it. It also includes instructions on booting from a hard disk connected to the host adapter.
- [Appendix A](#) provides general information and configuration rules about the host adapter.
- [Appendix B](#) contains the specifications for the low-voltage differential (LVD) host adapter.
- [Appendix C](#) contains the Declaration of Conformity, regulatory, and essential safety information.

---

## Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at

<http://docs.sun.com>

---

# Typographic Conventions

Typeface*	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, type <code>rm filename</code> .

\* The settings on your browser might differ from these settings.

---

## Related Documentation

Application	Title	Part Number
Installation	<i>Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes</i>	817-5828-xx
	<i>Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Guide to Documentation</i>	817-6237-10

---

# Accessing Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

<http://www.sun.com/documentation>

To access Solaris OS usage documents listed under “Using UNIX Commands” on page vi and the SunVTS™ software documents listed in “Before You Read This Book” on page v, go to [docs.sun.com](http://docs.sun.com). To access the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes* at Sun’s Network Storage documentation web site, follow the steps on the next page.

## ▼ To Access the Release Notes

1. Access the release notes at Sun’s web site by using one of the following methods.

- Go to [www.sun.com](http://www.sun.com) and follow these links:

a. Click [Products & Services](#).

b. Under [Browse Products](#), click [Storage](#).

c. In the right frame, under [Use](#), click [Documentation](#).

d. Under [Hardware/Storage](#), click [StorEdge](#).

- Alternately, you can go directly to this address:

<http://docs.sun.com/db/prod/storedge#hic>

2. From the product list, click [Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter](#).

3. In the documentation list, click the row listing the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes*.

---

**Note** – Viewing and printing documents in Adobe® Portable Document Format (PDF) requires Adobe Acrobat Reader, which is downloadable for free from: [www.adobe.com/products/acrobat/readstep.html](http://www.adobe.com/products/acrobat/readstep.html).

---



---

## Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

---

## Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

<http://www.sun.com/service/contacting>

---

## Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

<http://www.sun.com/hwdocs/feedback>

Please include the title and part number of your document with your feedback:

*Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Installation Guide*, part number 817-5827-13



# Installing, Connecting, and Testing the Host Adapter

---

This chapter describes the Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter and explains how to install it into a host, connect it to SCSI storage devices, test the installation, and boot from a disk drive connected to the host adapter.

---

**Note** – If you are unfamiliar with Ultra320 SCSI configuration guidelines, read [“Ultra320 SCSI Configuration” on page 13](#) before performing the procedures in this chapter.

---

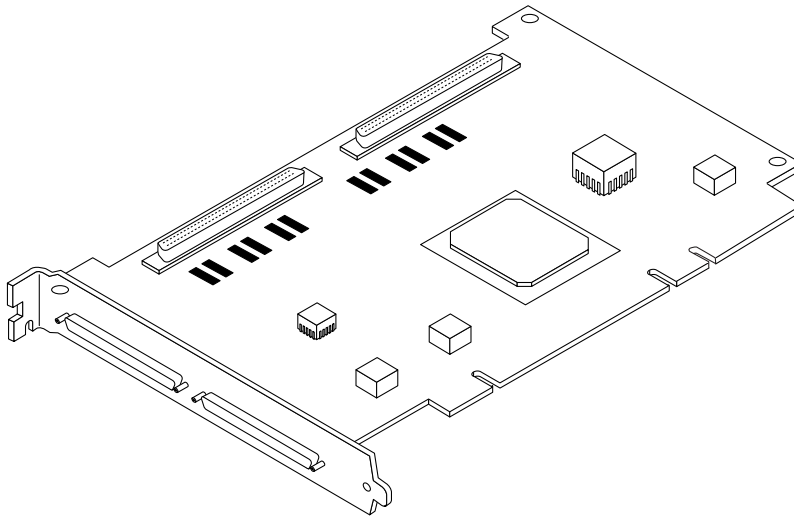
This chapter discusses the following topics:

- [“Features” on page 2](#)
- [“Installing the Host Adapter” on page 3](#)
- [“Connecting the Host Adapter” on page 8](#)
- [“Testing the Host Adapter” on page 9](#)
- [“Booting the Host Adapter” on page 11](#)

---

# Features

The Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter is a dual-channel Ultra320 SCSI to PCI/PCI-X host adapter that provides two Ultra320 SCSI channels.



**FIGURE 1-1** Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter

The host adapter includes the following features:

- Two independent Ultra320 SCSI channels with support for SCSI speeds of up to 320 Mbyte/sec with 16-bit data transfer
- Four SCSI connectors:
  - Two external 68-pin very high density cable interconnect (VHDCI) right-angle connectors
  - Two internal 68-pin high density right-angle connectors. .
- LVD SCSI support for disk arrays, tape libraries, and tape drives:
  - Two 16-bit LVD interfaces with support for up to 15 targets on each SCSI bus
  - Active LVD termination
- 32K bytes of NVSRAM (reserved feature)
- Backward-compatible with SCSI-2 and SCSI-3 (Ultra1, Ultra2, and Ultra3) devices. For Sun StorEdge systems qualified and supported with this host adapter, see *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes, 817-5828-xx*.

- 512K bytes of Flash ROM for booting in a Sun SPARC or a Sun Solaris x86 OS processor-based host system
- A 64-bit universal type board edge connector that provides:
  - 64-bit, 133-MHz PCI-X interface compatibility
  - 32-bit/64-bit PCI interface backwards compatibility

---

## Installing the Host Adapter

Before you start, read these instructions, and also read the installation instructions in the documentation that applies to the storage device(s) to be connected to the host adapter. Also, before installing the host adapter, read the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes* for required information, including lists of supported cables and storage devices. Downloading the release notes is described in [“To Access the Release Notes” on page viii](#)



---

**Caution** – This host adapter is only for connection to a single-ended (SE) or low-voltage differential (LVD) device, and it does not work if connected to a high-voltage differential (HVD) device.

---



---

**Caution** – Damage to the HBA can occur as the result of careless handling or electrostatic discharge (ESD). Always handle the HBA with care to avoid damage to electrostatic sensitive components.

---

To minimize the possibility of ESD-related damage, Sun strongly recommends using both a workstation antistatic mat and an ESD wrist strap. You can get an ESD wrist strap from any reputable electronics store or from Sun as part number #250-1007. Observe the following precautions to avoid ESD-related problems:

- Leave the HBA in its antistatic bag until you are ready to install it in the system.
- Always use a properly fitted and grounded wrist strap or other suitable ESD protection when handling the HBA and observe proper ESD grounding techniques.
- Hold the HBA by the edge of the PCB or mounting bracket, not the connectors.
- Place the HBA on a properly grounded antistatic work surface pad when it is out of its protective antistatic bag.

## ▼ To Prepare for Hardware Installation

1. **Read and observe the safety information at the back of this book.**

See “[Safety Agency Compliance Statements](#)” on page 27.

2. **Install the Solaris 8 2/04 (minimum required version) operating system on the host.**

3. **Install the Solaris 8 2/04 (minimum required version) recommended patch cluster on the host.**

See the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes* for how to download and install the Solaris OS recommended patch cluster.

4. **Install any required driver patches on the host.**

See the release notes to find the applicable patches for the version of the Solaris OS that is installed on the host. Also see the release notes for how to download the driver and any required patches. If needed, see “[To Access the Release Notes](#)” on page viii.



---

**Caution** – If the driver and any required patches described in the release notes are not installed, you cannot use the host adapter.

---

5. **Install the SunVTS software on the host.**

The SunVTS software is shipped on the Supplemental Software CD-ROM along with the Solaris operating system CD-ROM. Read the user’s guide listed in “[Before You Read This Book](#)” on page v for how to install the SunVTS software.

6. **Exit the operating environment.**

---

**Note** – If your system supports the PCI hot-plug capability, refer to the service documentation that came with your system. Then continue with [Step 8](#) below.

---

To inform any mounted users that the system will be going down, use the `shutdown` command. Otherwise, use the `init 0` command. See the Man Pages for these commands or the Solaris AnswerBook documentation.

```
# shutdown
...
ok
```

7. **Power off the system. Refer to the service documentation that came with your system.**



---

**Caution** – Do not disconnect the power cord from the system or from the wall outlet. This connection provides the ground path necessary to safely remove and install the printed circuit boards and components without damaging them.

---

**8. Choose a PCI-X (or PCI) slot for installing the host adapter.**

To maximize performance, use the host system's 64-bit, 66/133-MHz PCI/PCI-X slot for installing the host adapter.

---

**Note** – You can insert the host adapter into a 32-bit PCI slot if no 64-bit PCI-X slots are available. However, if you do this, the data transmission rate is limited to standard PCI speed.

---

## 9. Unpack the host adapter.

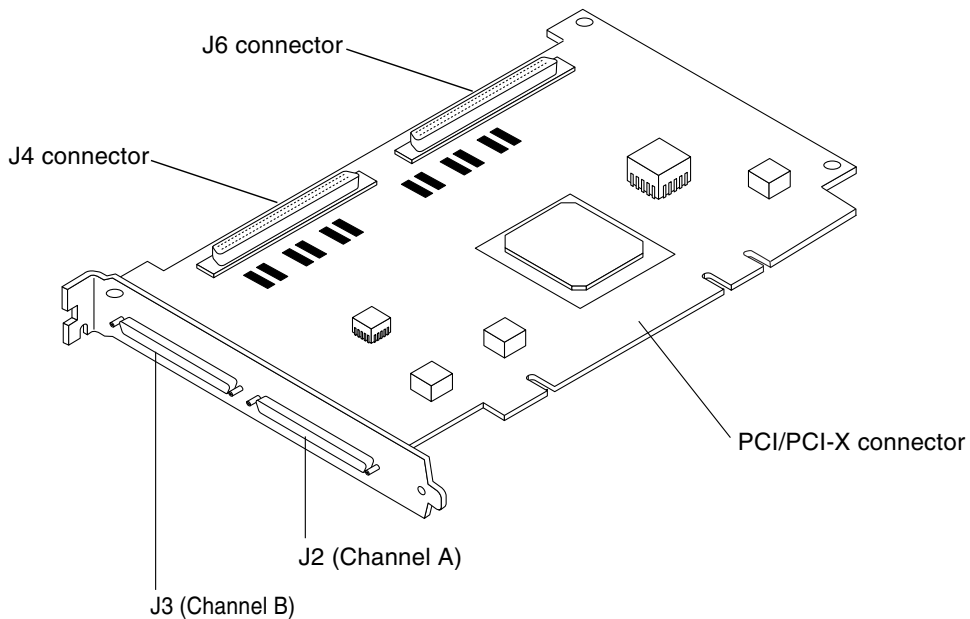
You should have the following items:

- Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter (Figure 1-1)
- Antistatic wrist strap

---

**Note** – Leave the host adapter in the protective bag until you are ready to install it.

---



**FIGURE 1-2** Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter VHDCI Connectors

The host adapter is shown in Figure 1-2. The Very High Density Cable Interconnect (VHDCI) connectors are for the VHDCI cables that are used to connect the host adapter to the storage device.

The next section provides instructions on how to install the host adapter in your system.




## ▼ To Install the Host Adapter

### 1. Open the system.

Refer to your system documentation for information about how to open the system.

### 2. Attach the wrist strap between your wrist and a metal part of the system chassis.

### 3. For systems with a standby-type power switch, disconnect the power cord.

Standby-type power switches have a  icon.

The wrist strap between you and the chassis provides the ground path necessary to safely remove and install the printed circuit boards and components without damaging them.

### 4. Remove the filler panel for the desired slot.

Refer to the system documentation for information about removing filler panels.

### 5. Remove the host adapter from its protective bag.

### 6. Install the host adapter in the selected PCI/PCI-X slot in your system.

See [Step 8](#) of the section “[To Prepare for Hardware Installation](#)” on [page 4](#) for how to choose a slot. Also, refer to the system’s hardware documentation for information about mounting details (mounting holes, standoff locking/unlocking, and screws to secure the card).



---

**Caution** – Using excessive force can bend or damage the host adapter edge connector. Make sure that the edge connector is properly aligned before pressing the adapter into place. The bracket around the two external connectors should fit into the empty space where the filler panel was removed in [Step 4](#).

---

### 7. Remove the wrist strap.

### 8. Close the system.

The next two sections describe how to connect the host adapter to one or more storage devices and how to test the host adapter.

---

# Connecting the Host Adapter

Before you connect the host adapter to the storage device(s), do the following:

- Refer to the release notes for the lists of supported cables and storage devices. Downloading the release notes is described in [“To Access the Release Notes” on page viii](#).
- Refer to [Appendix A, “Ultra320 SCSI Configuration” on page 13](#) for general information on configuration for Ultra320 SCSI devices.
- Refer to your system documentation and the storage device installation manual for specific cabling instructions.

## ▼ To Connect SCSI Cable(s) From the Host Adapter to the Storage Device(s)

1. **Connect the host adapter to the storage device(s) using the appropriate cable(s). Refer to Table 1-1 for SCSI interface connection information.**

**TABLE 1-1** Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Interfaces

SCSI Interface	External Connector	Internal Connector
Channel A	J2	J6
Channel B	J3	J4

---

# Testing the Host Adapter

You should test the host adapter installation using the `probe-scsi-all` command and, if the newly attached device is a disk array, with the SunVTS software.

## ▼ To Test the Installation Using the `probe-scsi-all` Command

1. If you have disconnected the power cable, reconnect it.
2. Power on the connected storage device(s) and then power on the host.
3. Bring the system down to the `ok` prompt at run level 0.

---

**Note** – If the host starts to reboot, interrupt the reboot process by pressing the Stop and A keys simultaneously.

---

4. At the `ok` prompt, enter the `probe-scsi-all` command to verify that the system recognizes the host adapter.

The `probe-scsi-all` command displays the SCSI devices connected to the host, as shown in the following screen example.

```
ok probe-scsi-all
/pci@4,2000/pci@1/scsi@2
Target 0
Unit 0 DISK SEAGATE ST336605LSUN36G 0238
/pci@4,2000/pci@1/scsi@2,1
Target 0
Unit 0 DISK SEAGATE ST336605LSUN36G 0238
```

In this example, the first SCSI port (`scsi@2`) has one disk drive connected (Target 0). The second SCSI port (`scsi@2,1`) also has one disk drive connected (Target 0). In the illustration of the host adapter in Figure 1-1, the first SCSI port is labeled as Channel A; the second SCSI port as Channel B.

## ▼ To Test the Installation With the SunVTS Software

Use the the SunVTS software to test a disk on a newly-attached disk array, to verify that the host adapter is properly installed.

For details about running the the SunVTS software, refer to the *SunVTS 5.X User's Guide* and the *SunVTS 5.X Test Reference Manual*.

1. As superuser, open the SunVTS window.

```
# /opt/SUNWvts/bin/sunvts
```

2. From the System Map, select a disk drive that is in an array connected to the host adapter.
3. Start the disk test.
4. Verify that no errors have occurred by checking the SunVTS status window.
5. If no problems occur, stop the SunVTS software.

Your host adapter is now ready to run applications.

---

**Note** – If problems occur, please contact your service provider for assistance.

---

---

# Booting the Host Adapter

The Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter uses the `mpt` driver, which is included with the Solaris operating system beginning with the Solaris 8 2/04 OS release and the Solaris 9 4/04 OS release. This enables you to “warm” boot directly from a hard disk connected to the host adapter if that disk has at least the Solaris 8 2/04 OS release or the Solaris 9 4/04 OS release installed.

---

**Note** – A “warm” boot requires that the hard disk attached to the host adapter be powered on and available at the time the server is powered up. A “cold” boot, where both the server and hard disk are powered up at the same time, is not supported by the `mpt` driver.

---

After booting, you should install any required patches for the `mpt` driver. Refer to the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes* for instructions on downloading and installing `mpt` driver patches. To view the Release Notes, see [“To Access the Release Notes” on page viii](#).

---

**Note** – The Sun StorEdge 3310 standalone SCSI array is presently limited to Ultra160 SCSI bus speeds only. Normally, the host adapter automatically lowers the transfer speed for attached storage devices that are not Ultra320 capable. However, for the Sun StorEdge 3310 standalone SCSI array, you must create an `mpt.conf` file to limit the Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter to Ultra160 SCSI bus speeds.

For instructions on creating the `mpt.conf` file, refer to the *Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter Release Notes*. To view the Release Notes, see [“To Access the Release Notes” on page viii](#).

---



## Ultra320 SCSI Configuration

---

This appendix provides general information about Ultra320 SCSI configuration rules. The following topics are discussed:

- [“Target Devices” on page 13](#)
- [“Bus Length” on page 14](#)
- [“Cabling and Termination” on page 15](#)
- [“SCSI Symbols” on page 16](#)

---

### Target Devices

For Ultra320 SCSI performance of up to 320 Mbytes/sec, there can be a maximum of 15 devices connected to each port on the host adapter.

The available target addresses (SCSI IDs) for each port on the host adapter are 0 through F.

---

**Note** – The SCSI ID of 7 is reserved for the host adapter.

---

# Bus Length

The maximum SCSI bus length is determined by the SCSI bus type (that is, the number of devices connected).

Table A-1 shows the maximum SCSI bus lengths for Ultra320 SCSI with a 8/16-bit bus width.

**TABLE A-1** Bus Restrictions

SCSI Type	Peak MBytes /sec	Single-Ended		LVD	
		Max Length <sup>*</sup>	No. of Devices	Max Length <sup>*</sup>	No. of Devices
SCSI-2					
Narrow	10	3	8	25 12	2 8
Wide	20	3	16	25 12	2 16
SCSI-3 Ultra1					
Narrow	20	1.5 3	8 4	25 12	2 8
Wide	40	1.5 3	8 4	25 12	2 16
SCSI-3 Ultra2					
Narrow	40	N/S <sup>\</sup>	N/S	25 12	2 8
Wide	80	N/S	N/S	25 12	2 16
SCSI-3 Ultra3					
Narrow	80	N/S	N/S	25 12	2 8
Wide	160	N/S	N/S	25 12	2 16
SCSI-3 Ultra320					
Narrow	160	N/S	N/S	25 12	2 8
Wide	320	N/S	N/S	25 12	2 16

\* This maximum length (shown in meters) must include the internal bus length of your system. Sun qualifies cable lengths of only up to 10 meters (22.8 feet).

\ N/S = not supported



---

# Cabling and Termination

Use the following cabling guidelines to ensure proper device cabling and termination.

## Cabling

In order to maintain Ultra320 SCSI performance, all cables used must be Ultra320 SCSI compliant.

## Termination

- The SCSI bus must be correctly terminated at the end of the bus. Most Sun devices use auto-termination. See the documentation that came with the device.
- This host adapter has active terminators with an automatic means of enabling and disabling the termination. All the termination circuit derives its power from the PCI or SCSI bus. When the PCI bus power is removed, active SCSI termination is maintained if the other SCSI device supplies power to the Term Pwr pins of the SCSI bus.

---

# SCSI Symbols

One of the four following symbols is placed near a SCSI port to indicate which type of SCSI the port is using. The icon may appear alone or with descriptive text.



SE



LVD



LVD/MSE



HVD

Acronym	Meaning
SE	single-ended
LVD	low-voltage differential
MSE	multi-mode single ended
HVD	high-voltage differential

## Specifications

---

The chapter contains the specifications for the low-voltage differential (LVD) Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter.

The following topics are discussed:

- [“Physical Dimensions” on page 17](#)
- [“Power Requirements” on page 18](#)
- [“Performance Specifications” on page 18](#)
- [“PCI Edge Connector Pin Definitions” on page 19](#)
- [“SCSI Connector Pin Definitions” on page 21](#)

---

## Physical Dimensions

**TABLE B-1** Physical Dimensions

Dimension	Measurement	
	Board With Bracket	Board Without Bracket
Length	7.3 inches (185 meters)	6.9 inches (175 millimeters)
Width	5.0 inches (127 millimeters)	4.2 inches (107 millimeters)
Height	.85 inches (21.6 millimeters)	.5 inches (12.7 millimeters)
Weight	6.0 oz (43.42 g)	N/A

---

# Power Requirements

**TABLE B-2** Power Requirements

Voltage	Maximum Current
5V $\pm$ 5%	3A
3.3V $\pm$ 9%	0.0A
12V $\pm$ 5%	0.0A

---

# Performance Specifications

**TABLE B-3** Performance Specifications

Feature	Specification
PCI/PCI-X bus clock frequency	33 MHz, 66 MHz, and 133 MHz
PCI data burst rate	264 MBps* @33 MHz, 528 MBps @66 MHz, 1064 MBps @133 MHz
SCSI synchronous maximum transfer rate	320 MBps (wide)
PCI data/address lines	AD63-0
PCI modes	Master/slave
SCSI interface	Low-voltage differential
SCSI bus parity	Yes
SCSI cyclic redundancy check (CRC)	Yes
SCSI 8-bit bus devices	Yes
SCSI 16-bit bus devices	Yes

\* MBps = megabytes per second

# PCI Edge Connector Pin Definitions

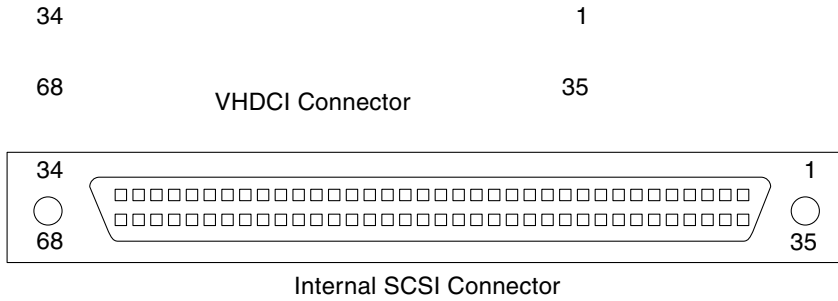
**TABLE B-4** PCI Edge Connector Pin Definitions J1B (Top)

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	-12V	25	+3.3V	49	GND	73	GND
2	TCK	26	C_BE3	50	KEYWAY	74	AD[55]
3	GND	27	AD23	51	KEYWAY	75	AD[53]
4	TDO	28	GND	52	AD08	76	GND
5	+5V	29	AD21	53	AD07	77	AD[51]
6	+5V	30	AD19	54	+3.3V	78	AD[49]
7	INTB	31	+3.3V	55	AD05	79	+5V/+3.3V
8	INTD	32	AD17	56	AD03	80	AD[47]
9	GND (PRSNT1)	33	C_BE2	57	GND	81	AD[45]
10	RESERVED	34	GND	58	AD01	82	GND
11	GND (PRSNT2)	35	IRDY	59	3V/5V	83	AD[43]
12	KEYWAY	36	+3.3V	60	ACK64	84	AD[41]
13	KEYWAY	37	DEVSEL	61	+5V	85	GND
14	RESERVED	38	GND	62	+5V	86	AD[39]
15	GND	39	LOCK	63	RESERVED	87	AD[37]
16	CLK	40	PERR	64	GND	88	+5V/+3.3V
17	GND	41	+3.3V	65	C/BE[6]#	89	AD[35]
18	REQ	42	SERR	66	C/BE[4]#	90	AD[33]
19	3V/5V	43	+3.3V	67	GND	91	GND
20	AD31	44	C_BE1	68	AD[63]	92	RESERVED
21	AD29	45	AD14	69	AD[61]	93	RESERVED
22	GND	46	GND	70	+5V/+3.3V	94	GND
23	AD27	47	AD12	71	AD[59]		
24	AD25	48	AD10	72	AD[57]		

**TABLE B-5** PCI Edge Connector Pin Definitions J1A (Bottom)

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	TRST	25	AD24	49	AD09	73	AD[56]
2	+12V	26	IDSEL	50	KEYWAY	74	AD[54]
3	TMS	27	+3.3V	51	KEYWAY	75	+5V/+3.3V
4	TDI	28	AD22	52	C_BE0	76	AD[52]
5	+5V	29	AD20	53	+3.3V	77	AD[50]
6	INTA	30	GND	54	AD06	78	GND
7	INTC	31	AD18	55	AD04	79	AD[48]
8	+5V	32	AD16	56	GND	80	AD[46]
9	RESERVED	33	+3.3V	57	AD02	81	GND
10	3V/5V	34	FRAME	58	AD00	82	AD[44]
11	RESERVED	35	GND	59	3V/5V	83	AD[42]
12	KEYWAY	36	TRDY	60	REQ64	84	+5V/+3.3V
13	KEYWAY	37	GND	61	+5V	85	AD[40]
14	RESERVED	38	STOP	62	+5V	86	AD[38]
15	RST	39	+3.3V	63	GND	87	GND
16	3V/5V	40	SDONE	64	C/BE[7]#	88	AD[36]
17	GNT	41	SBO	65	C/BE[5]#	89	AD[34]
18	GND	42	GND	66	+5V/+3.3V	90	GND
19	RESERVED	43	PAR	67	PAR64	91	AD[32]
20	AD30	44	AD15	68	AD[62]	92	RESERVED
21	+3.3V	45	+3.3V	69	GND	93	GND
22	AD28	46	AD13	70	AD[60]	94	RESERVED
23	AD26	47	AD11	71	AD[58]		
24	GND	48	GND	72	GND		

# SCSI Connector Pin Definitions



**FIGURE B-1** VHDCI and Internal SCSI Connectors

**TABLE B-6** SCSI Connector Pin Definitions

Pin	Description	Pin	Description	Pin	Description
1	+SD(12)	24	+RST	47	SD(6)-
2	+SD(13)	25	+MSG	48	SD(7)-
3	+SD(14)	26	+SEL	49	SDP-
4	+SD(15)	27	+C/D	50	Cable Sense (GND)
5	+SDP(1)	28	+REQ	51	TERMPWR
6	GND	29	+I/O	52	TERMPWR
7	+SD(0)	30	GND	53	OPEN
8	+SD(1)	31	+SD(8)	54	ATN-
9	+SD(2)	32	+SD(9)	55	GND
10	+SD(3)	33	+SD(10)	56	BSY-
11	+SD(4)	34	+SD(11)	57	ACK-
12	+SD(5)	35	SD(12)-	58	RST-
13	+SD(6)	36	SD(13)-	59	MSG-
14	+SD(7)	37	SD(14)-	60	SEL-
15	+SDP	38	SP(15)-	61	C/D-
16	DIFFSENS	39	SDP(1)-	62	REQ-
17	TERMPWR	40	GND	63	I/O-

**TABLE B-6** SCSI Connector Pin Definitions (*Continued*)

<b>Pin</b>	<b>Description</b>	<b>Pin</b>	<b>Description</b>	<b>Pin</b>	<b>Description</b>
18	TERMPWR	41	SD(0)-	64	GND
19	OPEN	42	SD(1)-	65	SD(8)-
20	+ATN	43	SD(2)-	66	SD(9)-
21	GND	44	SD(3)-	67	SD(10)-
22	+BSY	45	SD(4)-	68	SD(11)-
23	+ACK	46	SD(5)-		



# Declaration of Conformity, Regulatory Compliance, and Safety Statements

---

This appendix contains the following information that applies to the Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI host adapter:

- [“Declaration of Conformity” on page 24](#)
- [“Regulatory Compliance Statements” on page 26](#)
- [“Safety Agency Compliance Statements” on page 27](#)

# Declaration of Conformity

Compliance Model Number: LSI22320-SR  
Product Family Name: Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter (SGXPCI2SCSILM320-Z)

## EMC

### USA - FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

## European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

*As Telecommunication Network Equipment (TNE) in Both Telecom Centers and Other Than Telecom Centers per (as applicable):*

EN300-386 V.1.3.2 (2003-05) Required Limits:

EN 55022:1994 +A1:1995 +A2:1997	Class B
EN 61000-3-2:2000	Pass
EN 61000-3-3:1995 +A1:2000	Pass
IEC 61000-4-2	6 kV (Direct), 8 kV (Air)
IEC 61000-4-3	3 V/m 80-1000MHz, 10 V/m 800-960 MHz, and 1400-2000 MHz
IEC 61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines
IEC 61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor signal Lines > 10m
IEC 61000-4-6	3 V
IEC 61000-4-11	Pass

*As Information Technology Equipment (ITE) Class B per (as applicable):*

EN55022:1994 +A1 1995 +A2:1997	Class B
EN 61000-3-2:2000	Pass
EN 61000-3-3:1995 +A1:2000	Pass
EN 55024:1998 +A1: 2001 +A2:2003	Required Limits:
IEC 61000-4-2	4 kV (Direct), 8 kV (Air)
IEC 61000-4-3	3 V/m
IEC 61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
IEC 61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
IEC 61000-4-6	3 V
IEC 61000-4-8	1 A/m
IEC 61000-4-11	Pass

**Safety:** *This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:*

EC Type Examination Certificates:

EN60950-1:2001, First Edition	TÜV Rheinland Certificate No.
IEC 60950-1:2001, 1st Edition	CB Scheme Certificate No.
Evaluated to all CB Countries	
UL 60950:2000, 3rd Edition, CSA C22.2 No. 60950-00	File:

**Supplementary Information:** This equipment was tested and complies with all the requirements for the CE Mark. This equipment complies with the Restriction of Hazardous Substances (RoHS) directive 2002/95/EC.

/S/ \_\_\_\_\_ DATE  
Dennis P. Symanski  
Worldwide Compliance Office  
Sun Microsystems, Inc.  
4150 Network Circle, MPK15-102  
Santa Clara, CA 95054, U.S.A.  
Tel: 650-786-3255  
Fax: 650-786-3723

/S/ \_\_\_\_\_ DATE  
Donald Cameron  
Program Manager/Quality Systems  
Sun Microsystems Scotland, Limited  
Blackness Road, Phase I, Main Bldg.  
Springfield, EH49 7LR  
Scotland, United Kingdom  
Tel: +44 1 506 672 539  
Fax: +44 1 506 670 011



## Declaration of Conformity

Compliance Model Number: **LSI22320-SR**  
Product Family Name: **Sun StorEdge PCI/PCI-X Dual Ultra320 SCSI Host Adapter (SG-XPCI2SCSI-LM320)**

### EMC

USA - FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This equipment may not cause harmful interference.
- 2) This equipment must accept any interference that may cause undesired operation.

### European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

*As Telecommunication Network Equipment (TNE) in both Telecom Centers and Other Than Telecom Centers per (as applicable):*

EN300-386 V.1.3.1 (09-2001) Required Limits:

EN55022/CISPR22	Class B
EN61000-3-2	Pass
EN61000-3-3	Pass
EN61000-4-2	6 kV (Direct), 8 kV (Air)
EN61000-4-3	3 V/m 80-1000MHz, 10 V/m 800-960 MHz and 1400-2000 MHz
EN61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines.
EN61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m.
EN61000-4-6	3 V
EN61000-4-11	Pass

*As Information Technology Equipment (ITE) Class B per (as applicable):*

EN55022:1998/CISPR22:1997 Class B

EN55024:1998 Required Limits:

EN61000-4-2	4 kV (Direct), 8 kV (Air)
EN61000-4-3	3 V/m
EN61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
EN61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
EN61000-4-6	3 V
EN61000-4-8	1 A/m
EN61000-4-11	Pass
EN61000-3-2	Pass
EN61000-3-3	Pass

### Safety

*This equipment complies with the following requirements of Low Voltage Directive 73/23/EEC:*


EC Type Examination Certificates:

EN 60950:2000, 3rd Edition	TÜV Rheinland Certificate No.
IEC 60950:2000, 3rd Edition,	CB Scheme Certificate No.
Evaluated to all CB Countries	
UL 60950, 3rd Edition, CSA C22.2 No. 60950-00	File: Vol. Sec.

**Supplementary Information:** This product was tested and complies with all the requirements for the CE Mark.

 22 NOV 04  
DATE

Dennis P. Symanski  
Manager, Compliance Engineering  
Sun Microsystems, Inc.  
4150 Network Circle, MPK15-102  
Santa Clara, CA 95054, USA  
Tel: 650-786-3255  
Fax: 650-786-3723

 25 NOV 04  
DATE

Donald Cameron  
Program Manager  
Sun Microsystems Scotland, Limited  
Blackness Road, Phase I, Main Bldg  
Springfield, EH49 7LR  
Scotland, United Kingdom  
Tel: +44 1 506 672 539  
Fax: +44 1 506 670 011

# Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Department of Communications (DOC) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

## FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**Shielded Cables:** Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

**Modifications:** Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

## FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

**Shielded Cables:** Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

**Modifications:** Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

# Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

## Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

## Symbols

The following symbols may appear in this book:



**Caution** – There is a risk of personal injury and equipment damage. Follow the instructions.



**Caution** – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.



**Caution** – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Depending on the type of power switch your device has, one of the following symbols may be used:



**On** – Applies AC power to the system.



**Off** – Removes AC power from the system.



**Standby** – The On/Standby switch is in the standby position.

## Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

## Placement of a Sun Product



**Caution** – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

## Noise Level

In compliance with the requirements defined in DIN 45635 Part 1000, the workplace-dependent noise level of this product is less than 70 db(A).

## SELV Compliance

Safety status of I/O connections comply to SELV requirements.

## Power Cord Connection



**Caution** – Sun products are designed to work with power systems having a grounded neutral (grounded return for DC-powered products). To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.



**Caution** – Not all power cords have the same current ratings. Do not use the power cord provided with your equipment for any other products or use. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.



注意 – 添付の電源コードを他の装置や用途に使用しない  
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

The following caution applies only to devices with a Standby power switch:



**Caution** – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

The following caution applies only to devices with multiple power cords:



**Caution** – For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

## Battery Warning



**Caution** – There is danger of explosion if batteries are mishandled or incorrectly replaced. On systems with replaceable batteries, replace only with the same manufacturer and type or equivalent type recommended by the manufacturer per the instructions provided in the product service manual. Do not disassemble batteries or attempt to recharge them outside the system. Do not dispose of batteries in fire. Dispose of batteries properly in accordance with the manufacturer's instructions and local regulations. Note that on Sun CPU boards, there is a lithium battery molded into the real-time clock. These batteries are not customer replaceable parts.

## System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the cover before powering on your computer system.



**Caution** – Do not operate Sun products without the cover in place. Failure to take this precaution may result in personal injury and system damage.

## Rack System Warning

The following warnings apply to Racks and Rack Mounted systems.



**Caution** – For safety, equipment should always be loaded from the bottom up. That is, install the equipment that will be mounted in the lowest part of the rack first, then the next higher systems, etc.



**Caution** – To prevent the rack from tipping during equipment installation, the anti-tilt bar on the rack must be deployed.



**Caution** – To prevent extreme operating temperature within the rack insure that the maximum temperature does not exceed the product's ambient rated temperatures.



**Caution** – To prevent extreme operating temperatures due to reduced airflow consideration should be made to the amount of air flow that is required for a safe operation of the equipment.

## Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product  
Luokan 1 Laserlaitte  
Klasse 1 Laser Apparat  
Laser Klasse 1

## CD and DVD Devices

The following caution applies to CD, DVD, and other optical devices.



**Caution** – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

## Conformité aux normes de sécurité

Veillez lire attentivement cette section avant de commencer. Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

### Mesures de sécurité

Pour votre sécurité, nous vous recommandons de suivre scrupuleusement les mesures de sécurité ci-dessous lorsque vous installez votre matériel:

- Suivez tous les avertissements et toutes les instructions inscrites sur le matériel.
- Assurez-vous que la tension et la fréquence de votre source d'alimentation correspondent à la tension et à la fréquence indiquées sur l'étiquette de la tension électrique nominale du matériel
- N'introduisez jamais d'objets quels qu'ils soient dans les ouvertures de l'équipement. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet étranger conducteur risque de produire un court-circuit pouvant présenter un risque d'incendie ou de décharge électrique, ou susceptible d'endommager le matériel.

## Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés:



**Attention** – Vous risquez d'endommager le matériel ou de vous blesser. Veuillez suivre les instructions.



**Attention** – Surfaces brûlantes. Evitez tout contact. Les surfaces sont brûlantes. Vous risquez de vous blesser si vous les touchez.



---

**Attention** – Tensions dangereuses. Pour réduire les risques de décharge électrique et de danger physique, observez les consignes indiquées.

---

Selon le type d'interrupteur marche/arrêt dont votre appareil est équipé, l'un des symboles suivants sera utilisé:



---

**Marche** – Met le système sous tension alternative.

---



---

**Arrêt** – Met le système hors tension alternative.

---



---

**Veilleuse** – L'interrupteur Marche/Veille est sur la position de veille.

---

## Modification du matériel

N'apportez aucune modification mécanique ou électrique au matériel. Sun Microsystems décline toute responsabilité quant à la non-conformité éventuelle d'un produit Sun modifié.

## Positionnement d'un produit Sun



---

**Attention** – Evitez d'obstruer ou de recouvrir les orifices de votre produit Sun. N'installez jamais un produit Sun près d'un radiateur ou d'une source de chaleur. Si vous ne respectez pas ces consignes, votre produit Sun risque de surchauffer et son fonctionnement en sera altéré.

---

## Niveau de pression acoustique

Le niveau de pression acoustique du lieu de travail définie par la norme DIN 45 635 Part 1000 doit être au maximum de 70 db(A).

## Conformité SELV

Le niveau de sécurité des connexions E/S est conforme aux normes SELV.

## Connexion du cordon d'alimentation



---

**Attention** – Les produits Sun sont conçus pour fonctionner avec des systèmes d'alimentation équipés d'un conducteur neutre relié à la terre (conducteur neutre pour produits alimentés en CC). Pour réduire les risques de décharge électrique, ne branchez jamais les produits Sun sur une source d'alimentation d'un autre type. Contactez le gérant de votre bâtiment ou un électricien agréé si vous avez le moindre doute quant au type d'alimentation fourni dans votre bâtiment.

---



---

**Attention** – Tous les cordons d'alimentation ne présentent pas les mêmes caractéristiques électriques. Les cordons d'alimentation à usage domestique ne sont pas protégés contre les surtensions et ne sont pas conçus pour être utilisés avec des ordinateurs. N'utilisez jamais de cordon d'alimentation à usage domestique avec les produits Sun.

---

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur Veille:



---

**Attention** – L'interrupteur d'alimentation de ce produit fonctionne uniquement comme un dispositif de mise en veille. Le cordon d'alimentation constitue le moyen principal de déconnexion de l'alimentation pour le système. Assurez-vous de le brancher dans une prise d'alimentation mise à la terre près du système et facile d'accès. Ne le branchez pas lorsque l'alimentation électrique ne se trouve pas dans le châssis du système.

---

L'avertissement suivant s'applique uniquement aux systèmes équipés de plusieurs cordons d'alimentation:



---

**Attention** – Pour mettre un système équipé de plusieurs cordons d'alimentation hors tension, il est nécessaire de débrancher tous les cordons d'alimentation.

---



## Mise en garde relative aux batteries



**Attention** – Les batteries risquent d'exploser en cas de manipulation maladroite ou de remplacement incorrect. Pour les systèmes dont les batteries sont remplaçables, effectuez les remplacements uniquement selon le modèle du fabricant ou un modèle équivalent recommandé par le fabricant, conformément aux instructions fournies dans le manuel de service du système. N'essayez en aucun cas de démonter les batteries, ni de les recharger hors du système. Ne les jetez pas au feu. Mettez-les au rebut selon les instructions du fabricant et conformément à la législation locale en vigueur. Notez que sur les cartes processeur de Sun, une batterie au lithium a été moulée dans l'horloge temps réel. Les batteries ne sont pas des pièces remplaçables par le client.



**Attention** – Afin d'éviter que le rack ne penche pendant l'installation du matériel, tirez la barre anti-basculement du rack.



**Attention** – Pour éviter des températures de fonctionnement extrêmes dans le rack, assurez-vous que la température maximale ne dépasse pas la fourchette de températures ambiantes du produit déterminée par le fabricant.



**Attention** – Afin d'empêcher des températures de fonctionnement extrêmes provoquées par une aération insuffisante, assurez-vous de fournir une aération appropriée pour un fonctionnement du matériel en toute sécurité.

## Couvercle de l'unité

Pour ajouter des cartes, de la mémoire ou des périphériques de stockage internes, vous devez retirer le couvercle de votre système Sun. Remettez le couvercle supérieur en place avant de mettre votre système sous tension.



**Attention** – Ne mettez jamais des produits Sun sous tension si leur couvercle supérieur n'est pas mis en place. Si vous ne prenez pas ces précautions, vous risquez de vous blesser ou d'endommager le système.

## Avis de conformité des appareils laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

Class 1 Laser Product  
Luokan 1 Laserlaitte  
Klasse 1 Laser Apparat  
Laser Klasse 1

## Mise en garde relative au système en rack

La mise en garde suivante s'applique aux racks et aux systèmes montés en rack.



**Attention** – Pour des raisons de sécurité, le matériel doit toujours être chargé du bas vers le haut. En d'autres termes, vous devez installer, en premier, le matériel qui doit se trouver dans la partie la plus inférieure du rack, puis installer le matériel sur le niveau suivant, etc.



## Périphériques CD et DVD

L'avertissement suivant s'applique aux périphériques CD, DVD et autres périphériques optiques:

**Attention** – L'utilisation de contrôles et de réglages ou l'application de procédures autres que ceux spécifiés dans le présent document peuvent entraîner une exposition à des radiations dangereuses.

## Einhaltung sicherheitsbehördlicher Vorschriften

Lesen Sie vor dem Ausführen von Arbeiten diesen Abschnitt. Im folgenden Text werden Sicherheitsvorkehrungen beschrieben, die Sie bei der Installation eines Sun Microsystems-Produkts beachten müssen.

### Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz bei der Installation des Geräts die folgenden Sicherheitsvorkehrungen:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Stellen Sie sicher, dass Spannung und Frequenz der Stromversorgung den Nennleistungen auf dem am Gerät angebrachten Etikett entsprechen.
- Führen Sie niemals Fremdoobjekte in die Öffnungen am Gerät ein. Es können gefährliche Spannungen anliegen. Leitfähige Fremdoobjekte können einen Kurzschluss verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

### Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:



**Achtung** – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.



**Achtung** – Heiße Oberfläche. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.



**Achtung** – Gefährliche Spannungen. Befolgen Sie die Anweisungen, um Stromschläge und Verletzungen zu vermeiden.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole verwendet werden:



**Ein** – Versorgt das System mit Wechselstrom.



**Aus** – Unterbricht die Wechselstromzufuhr zum Gerät.



**Wartezustand** – Der Ein-/Standby-Netzschalter befindet sich in der Standby-Position.

### Modifikationen des Geräts

Nehmen Sie keine elektrischen oder mechanischen Gerätemodifikationen vor. Sun Microsystems ist für die Einhaltung der Sicherheitsvorschriften von modifizierten Sun-Produkten nicht haftbar.

### Aufstellung von Sun-Geräten



**Achtung** – Geräteöffnungen Ihres Sun-Produkts dürfen nicht blockiert oder abgedeckt werden. Sun-Geräte sollten niemals in der Nähe von Heizkörpern oder Heißluftklappen aufgestellt werden. Die Nichtbeachtung dieser Richtlinien kann Überhitzung verursachen und die Zuverlässigkeit Ihres Sun-Geräts beeinträchtigen.

### Lautstärke

Gemäß den in DIN 45 635 Teil 1000 definierten Vorschriften beträgt die arbeitsplatzbedingte Lautstärke dieses Produkts weniger als 70 dB(A).

### SELV-Konformität

Der Sicherheitsstatus der E/A-Verbindungen entspricht den SELV-Anforderungen.

## Anschluss des Netzkabels

---



**Achtung** – Sun-Geräte sind für Stromversorgungssysteme mit einem geerdeten neutralen Leiter (geerdeter Rückleiter bei gleichstrombetriebenen Geräten) ausgelegt. Um die Gefahr von Stromschlägen zu vermeiden, schließen Sie das Gerät niemals an andere Stromversorgungssysteme an. Wenden Sie sich an den zuständigen Gebäudeverwalter oder an einen qualifizierten Elektriker, wenn Sie nicht sicher wissen, an welche Art von Stromversorgungssystem Ihr Gebäude angeschlossen ist.

---



**Achtung** – Nicht alle Netzkabel verfügen über die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastschutz und sind daher für Computersysteme nicht geeignet. Verwenden Sie bei Ihrem Sun-Produkt keine Haushalts-Verlängerungskabel.

---

Die folgende Warnung gilt nur für Geräte mit Standby-Netzschalter:



**Achtung** – Beim Netzschalter dieses Geräts handelt es sich nur um einen Ein-/Standby-Schalter. Zum völligen Abtrennen des Systems von der Stromversorgung dient hauptsächlich das Netzkabel. Stellen Sie sicher, dass das Netzkabel an eine frei zugängliche geerdete Steckdose in der Nähe des Systems angeschlossen ist. Schließen Sie das Stromkabel nicht an, wenn die Stromversorgung vom Systemchassis entfernt wurde.

---

Die folgende Warnung gilt nur für Geräte mit mehreren Netzkabeln:



**Achtung** – Bei Produkten mit mehreren Netzkabeln müssen alle Netzkabel abgetrennt werden, um das System völlig von der Stromversorgung zu trennen.

---

## Warnung bezüglich Batterien

---



**Achtung** – Bei unsachgemäßer Handhabung oder nicht fachgerechtem Austausch der Batterien besteht Explosionsgefahr. Verwenden Sie bei Systemen mit austauschbaren Batterien ausschließlich Ersatzbatterien desselben Typs und Herstellers bzw. einen entsprechenden, vom Hersteller gemäß den Anweisungen im Service-Handbuch des Produkts empfohlenen Batterietyp. Versuchen Sie nicht, die Batterien auszubauen oder außerhalb des Systems wiederaufzuladen. Werfen Sie die Batterien nicht ins Feuer. Entsorgen Sie die Batterien entsprechend den Anweisungen des Herstellers und den vor Ort geltenden Vorschriften. CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie. Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgetauscht werden.

---

## Gehäuseabdeckung

Sie müssen die Abdeckung Ihres Sun-Computersystems entfernen, um Karten, Speicher oder interne Speichergeräte hinzuzufügen. Bringen Sie vor dem Einschalten des Systems die Gehäuseabdeckung wieder an.



**Achtung** – Nehmen Sie Sun-Geräte nicht ohne Abdeckung in Betrieb. Die Nichtbeachtung dieses Warnhinweises kann Verletzungen oder Geräteschaden zur Folge haben.

---

## Warnungen bezüglich in Racks eingebauter Systeme

Die folgenden Warnungen gelten für Racks und in Racks eingebaute Systeme:



**Achtung** – Aus Sicherheitsgründen sollten sämtliche Geräte von unten nach oben in Racks eingebaut werden. Installieren Sie also zuerst die Geräte, die an der untersten

Position im Rack eingebaut werden, gefolgt von den Systemen, die an nächsthöherer Stelle eingebaut werden, usw.



**Achtung** – Verwenden Sie beim Einbau den Kippschutz am Rack, um ein Umkippen zu vermeiden.



**Achtung** – Um extreme Betriebstemperaturen im Rack zu vermeiden, stellen Sie sicher, dass die Maximaltemperatur die Nennleistung der Umgebungstemperatur für das Produkt nicht überschreitet



**Achtung** – Um extreme Betriebstemperaturen durch verringerte Luftzirkulation zu vermeiden, sollte die für den sicheren Betrieb des Geräts erforderliche Luftzirkulation eingesetzt werden.

## Hinweis zur Laser-Konformität

Sun-Produkte, die die Laser-Technologie verwenden, entsprechen den Laser-Anforderungen der Klasse 1.

Class 1 Laser Product  
Luokan 1 Laserlaite  
Klasse 1 Laser Apparat  
Laser Klasse 1

## CD- und DVD-Geräte

Die folgende Warnung gilt für CD-, DVD- und andere optische Geräte:



**Achtung** – Die hier nicht aufgeführte Verwendung von Steuerelementen, Anpassungen oder Ausführung von Vorgängen kann eine gefährliche Strahlenbelastung verursachen.

## Normativas de seguridad

Lea esta sección antes de realizar cualquier operación. En ella se explican las medidas de seguridad que debe tomar al instalar un producto de Sun Microsystems.

## Medidas de seguridad

Para su protección, tome las medidas de seguridad siguientes durante la instalación del equipo:

- Siga todos los avisos e instrucciones indicados en el equipo.
- Asegúrese de que el voltaje y frecuencia de la fuente de alimentación coincidan con el voltaje y frecuencia indicados en la etiqueta de clasificación eléctrica del equipo.
- No introduzca objetos de ningún tipo por las rejillas del equipo, ya que puede quedar expuesto a voltajes peligrosos. Los objetos conductores extraños pueden producir cortocircuitos y, en consecuencia, incendios, descargas eléctricas o daños en el equipo.

## Símbolos

En este documento aparecen los siguientes símbolos:



**Precaución** – Existe el riesgo de que se produzcan lesiones personales y daños en el equipo. Siga las instrucciones.



**Precaución** – Superficie caliente. Evite todo contacto. Las superficies están calientes y pueden causar lesiones personales si se tocan.



**Precaución** – Voltaje peligroso. Para reducir el riesgo de descargas eléctricas y lesiones personales, siga las instrucciones.

En función del tipo de interruptor de alimentación del que disponga el dispositivo, se utilizará uno de los símbolos siguientes:



**Encendido** – Suministra alimentación de CA al sistema.



**Apagado** – Corta la alimentación de CA del sistema.



**Espera** – El interruptor de encendido/espera está en la posición de espera.

## Modificaciones en el equipo

No realice modificaciones de tipo mecánico ni eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de normativas en caso de que un producto Sun se haya modificado.

## Colocación de un producto Sun



**Precaución** – No obstruya ni tape las rejillas del producto Sun. Nunca coloque un producto Sun cerca de radiadores ni fuentes de calor. Si no sigue estas indicaciones, el producto Sun podría sobrecalentarse y la fiabilidad de su funcionamiento se vería afectada.

## Nivel de ruido

De conformidad con los requisitos establecidos en el apartado 1000 de la norma DIN 45635, el nivel de ruido en el lugar de trabajo producido por este producto es menor de 70 db(A).

## Cumplimiento de la normativa para instalaciones SELV

Las condiciones de seguridad de las conexiones de entrada y salida cumplen los requisitos para instalaciones SELV (del inglés *Safe Extra Low Voltage*, voltaje bajo y seguro).

## Conexión del cable de alimentación



**Precaución** – Los productos Sun se han diseñado para funcionar con sistemas de alimentación que cuenten con un conductor neutro a tierra (con conexión a tierra de regreso para los productos con alimentación de CC). Para reducir el riesgo de descargas eléctricas, no conecte ningún producto Sun a otro tipo de sistema de alimentación. Póngase en contacto con el encargado de las instalaciones de su empresa o con un electricista cualificado en caso de que no esté seguro del tipo de alimentación del que se dispone en el edificio.



**Precaución** – No todos los cables de alimentación tienen la misma clasificación eléctrica. Los alargadores de uso doméstico no cuentan con protección frente a sobrecargas y no están diseñados para su utilización con sistemas informáticos. No utilice alargadores de uso doméstico con el producto Sun.

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de un interruptor de alimentación de espera:



**Precaución** – El interruptor de alimentación de este producto funciona solamente como un dispositivo de espera. El cable de alimentación hace las veces de dispositivo de desconexión principal del sistema. Asegúrese de que conecta el cable de alimentación a una toma de tierra situada cerca del sistema y de fácil acceso. No conecte el cable de alimentación si la unidad de alimentación no se encuentra en el bastidor del sistema.

La siguiente medida solamente se aplica a aquellos dispositivos que dispongan de varios cables de alimentación:



**Precaución** – En los productos que cuentan con varios cables de alimentación, debe desconectar todos los cables de alimentación para cortar por completo la alimentación eléctrica del sistema.

## Advertencia sobre las baterías



**Precaución** – Si las baterías no se manipulan o reemplazan correctamente, se corre el riesgo de que estallen. En los sistemas que cuentan con baterías reemplazables, reemplácelas sólo con baterías del mismo fabricante y el mismo tipo, o un tipo equivalente recomendado por el fabricante, de acuerdo con las instrucciones descritas en el manual de servicio del producto. No desmonte las baterías ni intente recargarlas fuera del sistema. No intente deshacerse de las baterías echándolas al fuego. Deshágase de las baterías correctamente de acuerdo con las instrucciones del fabricante y las normas locales. Tenga en cuenta que en las placas CPU de Sun, hay una batería de litio incorporada en el reloj en tiempo real. Los usuarios no deben reemplazar este tipo de baterías.

## Cubierta de la unidad del sistema

Debe extraer la cubierta de la unidad del sistema informático Sun para instalar tarjetas, memoria o dispositivos de almacenamiento internos. Vuelva a colocar la cubierta antes de encender el sistema informático.



**Precaución** – No ponga en funcionamiento los productos Sun que no tengan colocada la cubierta. De lo contrario, puede sufrir lesiones personales y ocasionar daños en el sistema.

## Advertencia sobre el sistema en bastidor

Las advertencias siguientes se aplican a los sistemas montados en bastidor y a los propios bastidores.



**Precaución** – Por seguridad, siempre deben montarse los equipos de abajo arriba. A saber, primero debe instalarse el equipo que se situará en el bastidor inferior; a continuación, el que se situará en el siguiente nivel, etc.



**Precaución** – Para evitar que el bastidor se vuelque durante la instalación del equipo, debe extenderse la barra antivolcado del bastidor.



**Precaución** – Para evitar que se alcance una temperatura de funcionamiento extrema en el bastidor, asegúrese de que la temperatura máxima no sea superior a la temperatura ambiente establecida como adecuada para el producto.



**Precaución** – Para evitar que se alcance una temperatura de funcionamiento extrema debido a una circulación de aire reducida, debe considerarse la magnitud de la circulación de aire requerida para que el equipo funcione de forma segura.

## Aviso de cumplimiento de la normativa para la utilización de láser

Los productos Sun que utilizan tecnología láser cumplen los requisitos establecidos para los productos láser de clase 1.

Class 1 Laser Product  
Luokan 1 Laserlaite  
Klasse 1 Laser Apparat  
Laser Klasse 1

## Dispositivos de CD y DVD

La siguiente medida se aplica a los dispositivos de CD y DVD, así como a otros dispositivos ópticos:



---

**Precaución** – La utilización de controles, ajustes o procedimientos distintos a los aquí especificados puede dar lugar a niveles de radiación peligrosos.

---

## Nordic Lithium Battery Cautions

### Norge



---

**Advarsel** – Litiumbatteri —  
Ekspløsjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

---

### Sverige



---

**Varning** – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

---

### Danmark



---

**Advarsel!** – Litiumbatteri —  
Ekspløsjonsfare ved fejlagtig håndtering. Udsiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

---

### Suomi



---

**Varoitus** – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

---

